

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 25 October 2000 (25.10.00)	
International application No. PCT/US00/02198	Applicant's or agent's file reference MCA-389 PC
International filing date (day/month/year) 27 January 2000 (27.01.00)	Priority date (day/month/year) 29 January 1999 (29.01.99)
Applicant CHENG, Kwok-Shun et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 10 August 2000 (10.08.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. Forax Telephone No.: (41-22) 338.83.38
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From the INTERNATIONAL SEARCHING AUTHORITY

PCTNOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

To:

MILLIPORE CORPORATION
Attn. HUBBARD, J.
80 Ashby Road
Bedford, Massachusetts 01730
UNITED STATES OF AMERICADate of mailing
(day/month/year)

19/07/2000

Applicant's or agent's file reference

MCA-389 PC

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/US 00/ 02198

International filing date
(day/month/year)

27/01/2000

Applicant

MILLIPORE CORPORATION et al.

- 1.
- ☒
- The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.**Where?** Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35**For more detailed instructions,** see the notes on the accompanying sheet.

- 2.
- ☐
- The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

- 3.
- ☐
- With regard to the protest**
- against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

- 4.
- Further action(s):**
- The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority

European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Renate Jordan

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MCA-389 PC	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 02198	International filing date (day/month/year) 27/01/2000	(Earliest) Priority Date (day/month/year) 29/01/1999
Applicant MILLIPORE CORPORATION et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

II NATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/02198

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5032274	A	16-07-1991	US 4902456 A	20-02-1990
			US 4990294 A	05-02-1991
			DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
			EP 0340732 A	08-11-1989
			JP 2548092 B	30-10-1996
			JP 8034874 A	06-02-1996
			JP 2208329 A	17-08-1990
			JP 2573524 B	22-01-1997
			US 4906377 A	06-03-1990
EP 343247	A	29-11-1989	JP 1034407 A	03-02-1989
			JP 1880117 C	21-10-1994
			JP 4068010 B	30-10-1992
			JP 1034408 A	03-02-1989
			JP 1872522 C	26-09-1994
			JP 4068011 B	30-10-1992
			JP 1129043 A	22-05-1989
			JP 1956346 C	28-07-1995
			JP 6070155 B	07-09-1994
			DE 3878899 A	08-04-1993
			DE 3878899 T	22-07-1993
			WO 8900879 A	09-02-1989
			US 5158680 A	27-10-1992
			US 5286324 A	15-02-1994
US 4990294	A	05-02-1991	US 4902456 A	20-02-1990
			US 5032274 A	16-07-1991
			DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
			EP 0340732 A	08-11-1989
			JP 2548092 B	30-10-1996
			JP 8034874 A	06-02-1996
			JP 2208329 A	17-08-1990
			JP 2573524 B	22-01-1997
			US 4906377 A	06-03-1990
EP 340732	A	08-11-1989	US 4902456 A	20-02-1990
			DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
			JP 2548092 B	30-10-1996
			JP 8034874 A	06-02-1996
			JP 2208329 A	17-08-1990
			JP 2573524 B	22-01-1997
			US 4906377 A	06-03-1990
			US 4990294 A	05-02-1991
			US 5032274 A	16-07-1991
US 4902456	A	20-02-1990	DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
			EP 0340732 A	08-11-1989
			JP 2548092 B	30-10-1996
			JP 8034874 A	06-02-1996
			JP 2208329 A	17-08-1990
			JP 2573524 B	22-01-1997
			US 4906377 A	06-03-1990
			US 4990294 A	05-02-1991
			US 5032274 A	16-07-1991

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/02198

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B01D69/08 B01D67/00 B01D71/36 D01D5/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B01D D01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 032 274 A (L.Y.YEN ET AL) 16 July 1991 (1991-07-16) cited in the application claims; examples ---	1-6
A	EP 0 343 247 A (TORAY INDUSTRIES, INC) 29 November 1989 (1989-11-29) claims; examples & US 5 158 680 A 27 October 1992 (1992-10-27) cited in the application ---	1-29
A	US 4 990 294 A (L.Y.YEN ET AL) 5 February 1991 (1991-02-05) cited in the application claims; examples ---	7-19
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

* & * document member of the same patent family

Date of the actual completion of the international search

11 July 2000

Date of mailing of the international search report

19/07/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Cordero Alvarez, M

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 340 732 A (MILLIPORE CORPORATION) 8 November 1989 (1989-11-08) claims; examples & US 4 906 377 A 6 March 1990 (1990-03-06) cited in the application & US 4 990 294 A cited in the application & US 5 032 274 A cited in the application -----	1-29
A	US 4 902 456 A (L.Y.YEN ET AL) 20 February 1990 (1990-02-20) claims; examples -----	7-19

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

Wz

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

EINGEGANGEN

To:

HENKEL, FEILER & HÄNZEL
Möhlstrasse 37
D-81675 München
ALLEMAGNE

11 April 2001

PCT

**NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)**

Date of mailing
(day/month/year) 10.04.2001

Applicant's or agent's file reference
MCA-389 PC

IMPORTANT NOTIFICATION

International application No.
PCT/US00/02198

International filing date (day/month/year)
27/01/2000

Priority date (day/month/year)
29/01/1999

Applicant
MILLIPORE CORPORATION et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Fuerbass, C

Tel. +49 89 2399-8132



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference MCA-389 PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/02198	International filing date (day/month/year) 27/01/2000	Priority date (day/month/year) 29/01/1999
International Patent Classification (IPC) or national classification and IPC B01D71/00		
Applicant MILLIPORE CORPORATION et al.		


1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 10/08/2000	Date of completion of this report 10.04.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Luethe, H Telephone No. +49 89 2399 7519



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/02198

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, pages:

1-32 as originally filed

Claims, No.:

1-29 as originally filed

Drawings, sheets:

1/13-13/13 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/02198

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 9-13,16,18,19
	No: Claims 1-8,14,15,17,20-29
Inventive step (IS)	Yes: Claims
	No: Claims 1-29
Industrial applicability (IA)	Yes: Claims 1-29
	No: Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/02198

Re Item VIII

Certain observations on the international application

1. The application does not meet the requirements of Article 6 PCT, because claims 1-4, 20, 26 and 27 are not clear.
 - 1.1. Although the claims 1, 20, 26 and 27 have been drafted as separate independent product claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.
In this case **one** claim per category is appropriate.
 - 1.2. The applicant's attention is further drawn to the fact that the wording of claim 20 differs from that of claim 1 solely in that claim 20 refers to the method of claims 7-13.
It is presently not clear whether
 - a) one of claims 1 or 20 is simply redundant or if
 - b) by formulating two different claims having the same features the applicant intended to express that the hollow fiber membrane of claim 1 is not obtainable by the method of claims 7-13.In any case a) or b) a lack of clarity would arise (Article 6 PCT).
 - 1.3. In claims 1, 3, 4 and 20 it is attempted to characterise the subject-matter of said claims by the parameter "IPA flow time". The only reference in the description which is clearly related to the significance of this parameter is "Low flow times relate to higher membrane permeability and shorter filtration times" (cf. page 29, lines 11-12).
It is on the other hand not clear whether the information "The time interval to collect a set amount of IPA permeate is recorded" (cf. page 22, lines 28-29 under "Flow Rate Test") relates to the 'IPA flow time' at all.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/02198

Since the parameter 'IPA flow time' is not clearly defined it introduces an ambiguity about the scope of claims 1, 3, 4 and 20 and, thus, is not suitable to characterize their subject-matter (and see point 1.4 below).

- 1.4. In claims 1, 3, 4 and 20 it is presently attempted to define a product, here a "hollow fiber porous membrane", by a parameter, i.e. the "IPA flow time". This is, however, only allowable in those cases where
- A) those features cannot be adequately defined in any other way and
 - B) the corresponding parameters can be clearly and reliably determined either by indications in the description or by objective procedures which are usual in the art (cf. the PCT-Guidelines III-4.7a).
- In this case neither the condition A) nor B) is met.
- 1.5. The term "about" used in claims 1, 2, 3, 20 and 27 is vague and indefinite and, as such, renders the claim unclear (Article 6 PCT), especially when used to characterize a range (cf. claim 27).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

- D1: EP-A-0 343 247 (TORAY INDUSTRIES, INC) 29 November 1989 (1989-11-29) & US 5 158 680 A 27 October 1992 (1992-10-27) cited in the application
- D2: EP-A-0 340 732 (MILLIPORE CORPORATION) 8 November 1989 (1989-11-08) & US 4 906 377 A 6 March 1990 (1990-03-06) cited in the application & US 4 990 294 A cited in the application & US 5 032 274 A cited in the application
- D3: US-A-5 032 274 (L.Y.YEN ET AL) 16 July 1991 (1991-07-16) cited in the application.

The following document has come to the attention of the authorized officer:

- D4: US-A-5490931 (HOECHST CELANESE CORP.) 13 February 1996 (1996-02-

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/02198

13).

2. In so far as what can be understood from the claims (see point VIII above):
The present application does not satisfy the criterion set forth in Article 33 (2) PCT because the subject-matter of claims 1-8, 14, 15, 17 and 20-29 is not new as defined in the regulations (Rule 64 (1)-(3) PCT).

- 2.1. Present claim 7 obviously refers to a wet spinning method of hollow fibers from perfluorinated thermoplastic polymers (cf. page 14, line 28 to page 15, line 8;), i.e. a method with "a portion of said die being submerged in a cooling bath" (claim 7, step b)) characterizing a "submerged extrusion" (page 15, line 7).

This method however is anticipated, independently from each other, by the methods disclosed in D1 (cf. col. 4, line 58 to col. 5, line 12), D2 (cf. page 3, line 36 to page 6, line 14; the examples; "The imbibing extraction liquid can also function as a quench medium such that the molten film or hollow fibers can be extruded directly into it", page 4, lines 5-6), D3 (cf. col. 4, lines 54-64) and D4 (cf. col. 4, lines 48-50, example 1).

According to D1, D2, D3 and D4 the produced membranes are of perfluorinated thermoplastic polymers (D1: col. 8, line 37 to col. 9, line 5; the claims; D2: see the citations above and claims 1, 4-7; D3: examples; claims; D4: col. 2, line 63 to col.3, line 24). D1 and D2 further disclose, independently from each other, the specific polymers as disclosed by present claims 14 and 15 and the bath liquid of present claim 17.

Thus, as D1, D2, D3 and D4, independently from each other, disclose all the technical features defined by the subject-matter of claims 7 and 8 of the present application, and D1, D2 and D3, independently from each other, further disclose all the technical features defined by the subject-matter of claims 14, 15 and 17 of the present application, said subject-matter is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

- 2.2. It is an established physical principle that the same materials treated by the same process (see point 2.1 above) lead to the same products with identical technical properties.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/02198

In accordance with this principle and taking into account the teachings of D1, D2 and D3 (independently from each other) and the present application one would expect the products as disclosed by the present application and the prior art documents to have the same properties, including the IPA flow time (see present claims 1, 20) and the Sherwood- and Graetz numbers (see present claim 27). The prior art documents (see for example D3: col. 3, lines 4-14; col. 4, line 65 to col 5, line 26; col. 6, line 64 to col. 7, line 9; examples 1,3 and 6) further disclose both symmetric and asymmetric membranes.

Hence, as D1, D2 and D3, independently from each other, disclose all the technical features defined by the subject-matter of claims 1-6 and 20-29 of the present application, said subject-matter is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

- 2.3. Presently it seems that dependent claims 9-13, 16, 18 and 19 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

Re Item VII

Certain defects in the international application

The applicant's attention is further drawn to the fact that presently the application lack unity since, the subject-matter of claims 1, 7, 20, 26 and 27 is not so linked as to form a single general inventive concept (Rule 13.1 PCT) since a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between said subjects (see point V above)

REC'D 12 APR 2001

INFO

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference MCA-389 PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/02198	International filing date (day/month/year) 27/01/2000	Priority date (day/month/year) 29/01/1999
International Patent Classification (IPC) or national classification and IPC B01D71/00		
Applicant MILLIPORE CORPORATION et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 10/08/2000	Date of completion of this report 10.04.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Luethe, H Telephone No. +49 89 2399 7519 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/02198

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
Description, pages:

1-32 as originally filed

Claims, No.:

1-29 as originally filed

Drawings, sheets:

1/13-13/13 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/02198

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	9-13,16,18,19
	No:	Claims	1-8,14,15,17,20-29
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-29
Industrial applicability (IA)	Yes:	Claims	1-29
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item VIII

Certain observations on the international application

1. The application does not meet the requirements of Article 6 PCT, because claims 1-4, 20, 26 and 27 are not clear.
 - 1.1. Although the claims 1, 20, 26 and 27 have been drafted as separate independent product claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.
In this case **one** claim per category is appropriate.
 - 1.2. The applicant's attention is further drawn to the fact that the wording of claim 20 differs from that of claim 1 solely in that claim 20 refers to the method of claims 7-13.
It is presently not clear whether
 - a) one of claims 1 or 20 is simply redundant or if
 - b) by formulating two different claims having the same features the applicant intended to express that the hollow fiber membrane of claim 1 is not obtainable by the method of claims 7-13.In any case a) or b) a lack of clarity would arise (Article 6 PCT).
 - 1.3. In claims 1, 3, 4 and 20 it is attempted to characterise the subject-matter of said claims by the parameter "IPA flow time". The only reference in the description which is clearly related to the significance of this parameter is "Low flow times relate to higher membrane permeability and shorter filtration times" (cf. page 29, lines 11-12).
It is on the other hand not clear whether the information "The time interval to collect a set amount of IPA permeate is recorded" (cf. page 22, lines 28-29 under "Flow Rate Test") relates to the 'IPA flow time' at all.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/02198

Since the parameter 'IPA flow time' is not clearly defined it introduces an ambiguity about the scope of claims 1, 3, 4 and 20 and, thus, is not suitable to characterize their subject-matter (and see point 1.4 below).

- 1.4. In claims 1, 3, 4 and 20 it is presently attempted to define a product, here a "hollow fiber porous membrane", by a parameter, i.e. the "IPA flow time". This is, however, only allowable in those cases where
- A) those features cannot be adequately defined in any other way and
 - B) the corresponding parameters can be clearly and reliably determined either by indications in the description or by objective procedures which are usual in the art (cf. the PCT-Guidelines III-4.7a).
- In this case neither the condition A) nor B) is met.
- 1.5. The term "about" used in claims 1, 2, 3, 20 and 27 is vague and indefinite and, as such, renders the claim unclear (Article 6 PCT), especially when used to characterize a range (cf. claim 27).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

- D1: EP-A-0 343 247 (TORAY INDUSTRIES, INC) 29 November 1989 (1989-11-29) & US 5 158 680 A 27 October 1992 (1992-10-27) cited in the application
- D2: EP-A-0 340 732 (MILLIPORE CORPORATION) 8 November 1989 (1989-11-08) & US 4 906 377 A 6 March 1990 (1990-03-06) cited in the application & US 4 990 294 A cited in the application & US 5 032 274 A cited in the application
- D3: US-A-5 032 274 (L.Y.YEN ET AL) 16 July 1991 (1991-07-16) cited in the application.

The following document has come to the attention of the authorized officer:

- D4: US-A-5490931 (HOECHST CELANESE CORP.) 13 February 1996 (1996-02-

13).

2. In so far as what can be understood from the claims (see point VIII above):
The present application does not satisfy the criterion set forth in Article 33 (2) PCT because the subject-matter of claims 1-8, 14, 15, 17 and 20-29 is not new as defined in the regulations (Rule 64 (1)-(3) PCT).

- 2.1. Present claim 7 obviously refers to a wet spinning method of hollow fibers from perfluorinated thermoplastic polymers (cf. page 14, line 28 to page 15, line 8;), i.e. a method with "a portion of said die being submerged in a cooling bath" (claim 7, step b)) characterizing a "submerged extrusion" (page 15, line 7).

This method however is anticipated, independently from each other, by the methods disclosed in D1 (cf. col. 4, line 58 to col. 5, line 12), D2 (cf. page 3, line 36 to page 6, line 14; the examples; "The imbibing extraction liquid can also function as a quench medium such that the molten film or hollow fibers can be extruded directly into it", page 4, lines 5-6), D3 (cf. col. 4, lines 54-64) and D4 (cf. col. 4, lines 48-50, example 1).

According to D1, D2, D3 and D4 the produced membranes are of perfluorinated thermoplastic polymers (D1: col. 8, line 37 to col. 9, line 5; the claims; D2: see the citations above and claims 1, 4-7; D3: examples; claims; D4: col. 2, line 63 to col.3, line 24). D1 and D2 further disclose, independently from each other, the specific polymers as disclosed by present claims 14 and 15 and the bath liquid of present claim 17.

Thus, as D1, D2, D3 and D4, independently from each other, disclose all the technical features defined by the subject-matter of claims 7 and 8 of the present application, and D1, D2 and D3, independently from each other, further disclose all the technical features defined by the subject-matter of claims 14, 15 and 17 of the present application, said subject-matter is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

- 2.2. It is an established physical principle that the same materials treated by the same process (se point 2.1 above) lead to the same products with identical technical properties.

In accordance with this principle and taking into account the teachings of D1, D2 and D3 (independently from each other) and the present application one would expect the products as disclosed by the present application and the prior art documents to have the same properties, including the IPA flow time (see present claims 1, 20) and the Sherwood- and Graetz numbers (see present claim 27). The prior art documents (see for example D3: col. 3, lines 4-14; col. 4, line 65 to col 5, line 26; col. 6, line 64 to col. 7, line 9; examples 1,3 and 6) further disclose both symmetric and asymmetric membranes.

Hence, as D1, D2 and D3, independently from each other, disclose all the technical features defined by the subject-matter of claims 1-6 and 20-29 of the present application, said subject-matter is not new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT).

- 2.3. Presently it seems that dependent claims 9-13, 16, 18 and 19 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

Re Item VII

Certain defects in the international application

The applicant's attention is further drawn to the fact that presently the application lack unity since, the subject-matter of claims 1, 7, 20, 26 and 27 is not so linked as to form a single general inventive concept (Rule 13.1 PCT) since a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between said subjects (see point V above)

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MCA-389 PC	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 02198	International filing date (day/month/year) 27/01/2000	(Earliest) Priority Date (day/month/year) 29/01/1999
Applicant MILLIPORE CORPORATION et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/02198

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B01D69/08 B01D67/00 B01D71/36 D01D5/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01D D01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	✓ US 5 032 274 A (L.Y.YEN ET AL) 16 July 1991 (1991-07-16) cited in the application claims; examples ---	1-6
A	✓ EP 0 343 247 A (TORAY INDUSTRIES, INC) 29 November 1989 (1989-11-29) claims; examples & US 5 158 680 A 27 October 1992 (1992-10-27) cited in the application ---	1-29
A	✓ US 4 990 294 A (L.Y.YEN ET AL) 5 February 1991 (1991-02-05) cited in the application claims; examples ---	7-19

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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

11 July 2000

Date of mailing of the international search report

19/07/2000

Name and mailing address of the ISA

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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Cordero Alvarez, M

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 00/02198

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A ✓	EP 0 340 732 A (MILLIPORE CORPORATION) 8 November 1989 (1989-11-08) claims; examples & US 4 906 377 A 6 March 1990 (1990-03-06) cited in the application & US 4 990 294 A cited in the application & US 5 032 274 A cited in the application -----	1-29
A ✓	US 4 902 456 A (L.Y.YEN ET AL) 20 February 1990 (1990-02-20) claims; examples -----	7-19

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/02198

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5032274	A	16-07-1991	US 4902456 A	20-02-1990
			US 4990294 A	05-02-1991
			DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
			EP 0340732 A	08-11-1989
			JP 2548092 B	30-10-1996
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			US 4906377 A	06-03-1990
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EP 343247	A	29-11-1989	JP 1034407 A	03-02-1989
			JP 1880117 C	21-10-1994
			JP 4068010 B	30-10-1992
			JP 1034408 A	03-02-1989
			JP 1872522 C	26-09-1994
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			JP 1956346 C	28-07-1995
			JP 6070155 B	07-09-1994
			DE 3878899 A	08-04-1993
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			WO 8900879 A	09-02-1989
			US 5158680 A	27-10-1992
			US 5286324 A	15-02-1994
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US 4990294	A	05-02-1991	US 4902456 A	20-02-1990
			US 5032274 A	16-07-1991
			DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
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			DE 68923319 T	04-01-1996
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			JP 2208329 A	17-08-1990
			JP 2573524 B	22-01-1997
			US 4906377 A	06-03-1990
			US 4990294 A	05-02-1991
			US 5032274 A	16-07-1991
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US 4902456	A	20-02-1990	DE 68923319 D	10-08-1995
			DE 68923319 T	04-01-1996
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			JP 8034874 A	06-02-1996
			JP 2208329 A	17-08-1990
			JP 2573524 B	22-01-1997
			US 4906377 A	06-03-1990
			US 4990294 A	05-02-1991
			US 5032274 A	16-07-1991